

REMARKS

The foregoing amendments and the following remarks are responsive to the October 5, 2006 Office Action. Claims 1, 11, 12, and 13-18 have been amended. Thus, Claims 1-18 remain pending in the present application.

In response to the Office Action mailed October 5, 2006, Applicants respectfully request the Examiner to reconsider the above-captioned application in view of the foregoing amendments and the following comments.

Comments on Allowable Subject Matter

Applicants note with appreciation that the Examiner has indicated Claims 8-10 are in condition for allowance.

All Pending Claims Fully Comply With 35 U.S.C. § 112

Claims 13-18 stand objected to by the Examiner, the Examiner maintaining that the claims lack antecedent bases.

As described herein, Applicants have amended Claims 13-18 and Applicants submit that these claims fully comply with 35 U.S.C. § 112, second paragraph. Applicants further submit that none of the above amendments made in response to the objections have narrowed the claim language. Rather, all amendments have been made solely to clarify the claims. Thus, all of the equivalents of the original recitations in these claims are also equivalents of the now recited recitations.

Response to Rejection of Claims 12, 17, and 18 Under 35 U.S.C. § 101

In the August 9, 2006 Office Action, the Examiner rejects Claims 12, 17, and 18 under 35 U.S.C. § 101 as being directed to "non-statutory subject matter. The Examiner states that Claims 12, 17, and 18 fail to have a physical transformation or a useful, concrete, and tangible result. In particular, the Examiner states that "[m]erely analyzing . . . would not appear to be sufficient to constitute a tangible result, since the outcome of the analyzing step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized."

Applicants respectfully traverse this argument. Applicants submit that the Examiner has not established a *prima facie* case of ineligible subject matter pursuant to 35 U.S.C. § 101. "The examiner bears the initial burden . . . of presenting a *prima facie* case of unpatentability." *In re*

Oetiker, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). As outlined in the “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,” if the record as a whole suggests that it is more likely than not that the claimed invention would be considered a practical application of an abstract idea, natural phenomenon, or law of nature, the Examiner should not reject the claim. Only when the claimed invention is devoid of any limitation to a practical application should it be rejected under 35 U.S.C. § 101. See, M.P.E.P. § 2107, p. 2100-7 (Rev. 3, August 2005) (emphasis added). Upon the Examiner identifying and explaining in the record the basis for why a claim is for an abstract idea with no practical application, the burden shifts to Applicants to either amend the claim or make a showing of why the claim is eligible for patent protection. See, e.g., *In re Brana*, 52 F.3d 1560, 1566, 34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995); see generally M.P.E.P. § 2107. Applicants submit that the Examiner has not presented a *prima facie* case of unpatentability by explaining why the pending claims of the present application are devoid of any limitations to a practical application.

As explained in the “Interim Guidelines,” a claimed invention must accomplish a practical application by producing a “useful, concrete and tangible result.” (Citing *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1373-74, 47 U.S.P.Q.2d 1601-02 (Fed. Cir. 1998); see, also, *Ex parte Lundgren*, Appeal No. 2003-2088, B.P.A.I. 2005). Furthermore, claims directed to transformations of data of a physical quantity (e.g., data corresponding to detecting a reinforcing member within a laser-irradiated interaction region of a structure, as in the pending claims) produce a useful, concrete, and tangible result. See, M.P.E.P. § 2107, page 2100-16. Applicants submit that Claims 12, 17, and 18 of the present application include limitations to a practical application by producing a useful, concrete, and tangible result, thereby conforming to the requirements of 35 U.S.C. § 101.

Applicants submit that the claimed invention of Claims 12, 17, and 18 provide a useful result that is specific, substantial, and credible in accordance with M.P.E.P. § 2107. In addition, Applicants submit that the claimed invention of the claims produce concrete results that can be substantially repeated to substantially produce the same results again. Applicants also submit that by analyzing a spectrum of light for indications of an embedded material within a laser-irradiated interaction region of a structure, the claimed inventions of Claims 12, 17, and 18

provide tangible results by setting forth a practical application with real-world results. Therefore, Applicants submit that Claims 12, 17, and 18 of the present application satisfies the requirements of 35 U.S.C. § 101 by producing a useful, concrete, and tangible result.

Furthermore, to the extent that the Examiner is asserting that Claims 12, 17, and 18 encompass statutory subject matter only if they result in a physical transformation, Applicants submit that 35 U.S.C. § 101 does not include such a requirement. This requirement was explicitly addressed in *Application of Foster*, 438 F.2d 1011, 1014 (C.C.P.A. 1971), which held that claims should not be rejected for lack of appropriate subject matter simply because they include steps that transform one mental concept into another. Moreover, in *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358-59 (Fed. Cir. 1999), the court explicitly held that the assertion that a method claim is patentable only if it results in a physical transformation or contains a physical limitation is incorrect. Additionally, the fact that no physical alteration is required is also supported by the decision of the B.P.A.I. in *Ex parte Lundgren*, which involved claims directed to a method of compensating a manager, where the claims did not recite a required physical alteration.

Applicants respectfully submit that detection of embedded material is a practical application, and the final result achieved by the analysis step is useful, tangible, and concrete.

For the foregoing reasons, Applicants submits that Claims 12, 17, and 18 satisfy the requirements of 35 U.S.C. § 101 and Applicants respectfully request the Examiner to withdraw the rejections.

Satoru Does Not Disclose the Detection System Recited By Claims 11-13 and 15-17

Claims 11-13 and 15-17 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Satoru *et al.* (Japanese Patent No. 2002-296183) ("Satoru"). Applicants respectfully traverse the present rejections. However, to expedite the prosecution of the present application, Applicants have amended Claim 11. Applicants expressly reserve the right to further prosecute the original versions of Claims 11, 13, 15, and 16 through continuation practice.

Claims 11, 13, 15, and 16

Amended Claim 11 now recites: (emphasis added)

A detection system for use during drilling by irradiation of an interaction region of a structure with laser light, the structure comprising a first material and a

reinforcing member embedded in the first material, the detection system comprising:

means for focusing light emitted from the interaction region during drilling of the structure, the interaction region comprising a surface of the reinforcing member;

means for separating the focused light into a spectrum of wavelengths; and

means for analyzing at least a portion of the spectrum for indications of the reinforcing member within the interaction region, wherein the detection system is adapted to initiate cessation of drilling upon detecting the indications of the reinforcing member within the interaction region.

Satoru discloses a method of assessing the level of corrosion or susceptibility to corrosion of reinforcing members of a concrete structure through spectral analysis of light emitted by a plasma cloud of laser-ablated concrete. Satoru does not, for example, disclose a "means for analyzing at least a portion of the spectrum for indications of the reinforcing member within the interaction region, wherein the detection system is adapted to avoid damaging the reinforcing member upon detecting the indications of the reinforcing member within the interaction region" as recited by amended Claim 11.

Accordingly, Applicants submit that Satoru does not disclose or suggest all of the limitations of amended Claim 11. For at least this reason, Applicants respectfully request the Examiner withdraw the rejection of Claim 11 and pass this claim to allowance.

Claims 13, 15, and 16 depend from Claim 11. Applicants submit that Claims 13, 15, and 16 also define over the cited reference, not only because they depend from Claim 11, but also on their own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claims 13, 15, and 16 and pass these claims to allowance.

Claims 12 and 17

Amended Claim 12 recites: (emphasis added)

A method of detecting a reinforcing member within a laser-irradiated interaction region of a structure comprising a first material and the reinforcing member embedded in the first material, the method comprising:

focusing light from the interaction region during drilling by laser irradiation of the structure, **the interaction region comprising the reinforcing member, and the light including light from a surface of the reinforcing member, the surface exposed during drilling;**
separating the light into a spectrum of wavelengths; and

analyzing at least a portion of the spectrum for indications of the reinforcing member within the interaction region.

Satoru discloses a method of assessing the level of corrosion or susceptibility to corrosion of reinforcing members of a concrete structure through spectral analysis of light emitted by a plasma cloud of laser-ablated concrete. The method disclosed by Satoru specifically discloses avoiding exposure of the embedded reinforcing members for direct observation of their state of corrosion. Satoru discloses that avoiding exposing the reinforcing members reduces the cost of restoring the surface of the structure after direct measurements of corrosion are taken. Satoru, Description of the Prior Art, Paragraph 0002.

Thus, Satoru does not disclose "a method of detecting a reinforcing member within a laser-irradiated interaction region of a structure comprising a first material and the reinforcing member embedded in the first material, the method comprising focusing light from the interaction region during drilling, the interaction region comprising the reinforcing member, and the light including light from a surface of the reinforcing member, the surface exposed during drilling," as recited by amended Claim 12.

Accordingly Satoru fails to disclose or suggest all of the limitations of Claim 12. Therefore, Applicants respectfully request the Examiner withdraw the rejection of Claim 12 and pass this claim to allowance.

Claim 17 depends from Claim 12. Applicants submit that Claim 17 also defines over the cited reference, not only because it depends from Claim 12, but also on its own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claim 17 and pass this claim to allowance.

The Combination of Alexander and Satoru Does Not Make Claims 1, 2, 4, 7, 11-13, and 15-17

Obvious

Claims 1, 2, 4, 7, 11-13, and 15-17 stand rejected under 35 U.S.C. § 103(a) as being obvious over Alexander (U.S. Patent No. 5,847,825) ("Alexander") in view of Satoru. Applicants respectfully traverse the present rejections. However, to expedite the prosecution of the present application, Applicants have amended Claims 1 and 11. Applicants expressly reserve the right to further prosecute the original versions of Claims 1, 2, 4, 7, 11-13 and 15-17 through continuation practice.

Claims 1, 2, and 7

Amended Claim 1 now recites: (emphasis added)

A detection system for use during drilling by irradiation of an interaction region of a structure with laser light, the structure comprising a first material and a reinforcing member embedded in the first material, the detection system comprising:

a focusing lens positioned to receive light emitted from the interaction region during drilling of the structure, the interaction region comprising a surface of the reinforcing member;

an optical fiber optically coupled to the focusing lens to receive light from the focusing lens; and

a spectrometer optically coupled to the optical fiber to receive light from the optical fiber, the spectrometer adapted for analysis of the light for indications of the reinforcing member within the interaction region, **wherein the detection system is adapted to initiate cessation of drilling upon detecting the indications of the reinforcing member within the interaction region.**

Alexander discloses a method and apparatus for detection of trace elements in a soil sample by directing laser light at the sample to produce a plasma. Spectral analysis is then conducted on the plasma to determine its composition. Alexander does not disclose or suggest "a detection system ... adapted to initiate cessation of drilling upon detecting indications of the reinforcing member within the interaction region," as recited by amended Claim 1.

Satoru discloses an apparatus for vaporizing the surface of a structure to determine the existence or extent of corrosion of reinforcing structural members. Satoru does not disclose or suggest the limitations of amended Claim 1 which are not disclosed or suggested by Alexander. Accordingly, Alexander and Satoru, separately or in combination, fail to disclose or suggest all of the limitations of amended Claim 1. Therefore, Applicants respectfully request the Examiner withdraw the rejection of Claim 1 and pass this claim to allowance.

Claims 2 and 7 depend from Claim 1. Applicants submit that Claims 2 and 7 also define over the cited references, not only because they depend from Claim 1, but also on their own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claims 2 and 7 and pass these claims to allowance.

Claim 4

Claim 4 stands rejected as obvious over Alexander in view of Satoru. However, as discussed more fully below, Claim 4 depends from Claim 3, which is rejected as obvious over

Alexander in view of Satoru in further view of Jacobowitz *et al.* (U.S. Patent No. 4,060,327) ("Jacobowitz"). Thus, in view of the rejection of Claim 3, Applicants submit that Claim 4 is not obvious over Alexander in view of Satoru and request the Examiner withdraw the rejection and pass this claim to allowance.

Claims 11, 13, 15, and 16

As discussed above with regard to Claim 1, Alexander discloses a method and apparatus which creates a plasma from a sample and performs a spectral analysis on the plasma. Alexander does not disclose "a detection system ... adapted to initiate cessation of drilling upon detecting the indications of the reinforcing member within the interaction region." As recited by Claim 11. Accordingly, Alexander fails to disclose or suggest all of the limitations of amended Claim 11. Satoru does not disclose or suggest the limitations of amended Claim 11 which are not disclosed or suggested by Alexander. Therefore, Claim 11 is not obvious over Alexander in view of Satoru. Applicants respectfully request the Examiner withdraw the rejection of Claim 11 and pass this claim to allowance.

Claims 13, 15, and 16 depend from Claim 11. Applicants submit that Claims 13, 15, and 16 also define over the cited references, either alone or in combination, not only because they depend from Claim 11, but also on their own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claims 13, 15, and 16 and pass these claims to allowance.

Claims 12 and 17

As discussed above with regard to Claim 1, Alexander discloses an apparatus for performing spectral analysis on a soil sample. Accordingly, Alexander does not disclose or suggest "focusing light from the interaction region during drilling by laser irradiation of the structure, the interaction region comprising the reinforcing member, and the light including light from a surface of the reinforcing member, the surface exposed during drilling," as recited by amended Claim 12.

Satoru discloses a method of detecting corrosion of embedded structural reinforcing members without exposing the members from the structure. Therefore, Satoru does not disclose or suggest the limitations of amended Claim 12 which are not disclosed or suggested by

Alexander. For at least this reason, Applicants request the Examiner withdraw the rejection of Claim 12 and pass this claim to allowance.

Claim 17 depends from Claim 12. Applicants submit that Claim 17 also defines over the cited references, either alone or in combination, not only because it depends from Claim 12, but also on its own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claim 17 and pass this claim to allowance.

Claims 3 and 14 Are Not Obvious Over Alexander In View of Satoru in Further View of Jacobowitz

Claims 3 and 14 stand rejected under 35 U.S.C. § 103(a) as being obvious over Alexander in view of Satoru in further view of Jacobowitz. Applicants respectfully traverse the present rejections. However, as explained above, to expedite the prosecution of the present application, Applicants have amended Claims 1 and 11. Applicants expressly reserve the right to further prosecute the original versions of Claims 1, 3, 11 and 14 through continuation practice.

Claim 3

As described above, Applicants submit that amended Claim 1 is patentably distinguished over Alexander in view of Satoru. Jacobowitz discloses a wide band grating spectrometer with a neutral density filter. Applicants submit that Jacobowitz does not disclose or suggest the limitations of amended Claim 1 that are missing from the combination of Alexander and Satoru. Therefore, amended Claim 1 is patentably distinguished over Alexander in view of Satoru in further view of Jacobowitz.

Claim 3 depends from amended Claim 1. Applicants submit that Claim 3 also defines over the cited references, either alone or in combination, not only because it depends from amended Claim 1, but also on its own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claim 3 and pass this claim to allowance.

Claim 14

As described above, Applicants submit that amended Claim 11 is patentably distinguished over Alexander in view of Satoru. Applicants submit that Jacobowitz does not disclose or suggest the limitations of amended Claim 11 that are missing from the combination of Alexander and Satoru. Therefore, amended Claim 11 is patentably distinguished over Alexander in view of Satoru in further view of Jacobowitz.

Claim 14 depends from amended Claim 11. Applicants submit that Claim 14 also defines over the cited references, either alone or in combination, not only because it depends from amended Claim 11, but also on its own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claim 14 and pass this claim to allowance.

Claim 5 Is Not Obvious Over Alexander in View of Satoru in Further View of Jacobowitz

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being obvious over Alexander in view of Satoru in further view of Jacobowitz. Applicants respectfully traverse the present rejections. However, as explained above, to expedite the prosecution of the present application, Applicants have amended Claim 1. Applicants expressly reserve the right to further prosecute the original version of Claim 5 through continuation practice.

As described above, Applicants submit that amended Claim 1 is patentably distinguished over Alexander in view of Satoru. Applicants submit that Jacobowitz does not disclose or suggest the limitations of amended Claim 1 that are missing from the combination of Alexander and Satoru. Therefore, amended Claim 1 is patentably distinguished over Alexander in view of Satoru in further view of Jacobowitz.

Claim 5 depends from amended Claim 1. Applicants submit that Claim 5 also defines over the cited references, either alone or in combination, not only because it depends from amended Claim 1, but also on its own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claim 5 and pass this claim to allowance.

The Combination of Theriault and Satoru Does Not Make Claims 1 and 6 Obvious

Claims 1 and 6 stand rejected under 35 U.S.C. § 103(a) as being obvious over Theriault *et al.* (U.S. Patent No. 6,147,754) ("Theriault") in view of Satoru. Applicants respectfully traverse the present rejections. However, to expedite the prosecution of the present application, Applicants have amended Claim 1. Applicants expressly reserve the right to further prosecute the original versions of Claims 1 and 6 through continuation practice.

Theriault discloses a laser-induced spectroscopy cone penetrometer which generates energy in a soil sample, collects generated energy, and transmits the energy. Satoru discloses a method of detecting corrosion of embedded structural reinforcing members without exposing the members from the structure. Neither Theriault nor Satoru discloses or suggests "a detection

system ... adapted to initiate cessation of drilling upon detecting indications of the reinforcing member within the interaction region," as recited by Claim 1.

Accordingly, the combination of Theriault and Satoru does not disclose or suggest all the limitations of Claim 1. Therefore, Claim 1 is not obvious over Theriault in view of Satoru. Thus, Applicants respectfully request the Examiner withdraw the rejection of Claim 1 and pass this claim to allowance.

Claim 6 depends from Claim 1. Applicants submit that Claim 6 also defines over the cited references, not only because it depends from Claim 1, but also on its own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection of Claim 6 and pass this claim to allowance.

SUMMARY

For the reasons described above, Applicants respectfully request the Examiner withdraw the objection to and rejection of the claims and pass Claims 1-7 and 11-17 to allowance.

The undersigned has made a good faith effort to respond to all of the rejections and objections in the case and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if any issues require clarification, the Examiner is respectfully requested to call Applicant's attorney in order to resolve such issue promptly.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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